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Comments on two vertebrate samples from early Islamic Jazirat al-Hulaylah (5th-9th c. AD) and Islamic Julfar (mid-14th - 16th c. AD), United Arab Emirates

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Introduction

This paper discusses two vertebrate samples retrieved from Early Islamic Jazirat al-Hulaylah and Islamic Julfar, Ras al-Khaimah emirate, United Arab Emirates. The sample of bones from Jazirat al-Hulaylah originate from context M3 (951125), which belongs to the earliest stratigraphic level at the site, level 1 (Sasaki 1995,1996; Sasaki and Sasaki 1996), and dates to the 5th-9th century AD. The sample from Julfar comes from 18 different ovens and a house context belonging to Level 6 (Sasaki 1993,1994), and dates to the mid-14th to 16th century AD. The purpose of this analysis was to provide an initial evaluation of the range of animals which were exploited at the two sites. Although the samples discussed here are small and only represent a small part of the total assemblage retrieved from the two sites, it seemed worthwhile making some preliminary comments on the basis of this evaluation. The author is shortly about to commence studying the remainder of the vertebrate assemblages from these two sites as part of his Phd research at the University of York, UK.

Methods

On-site dry sieving with 4mm mesh was used for all excavated contexts at both Jazirat al-Hulaylah and Julfar to permit the systematic recovery of animal bones. Both samples of bones were identified at the University of York using the comparative osteological collections of the Environmental Archaeology Unit as well as the author's personal osteological reference collection of Arabian Gulf marine fishes.

All fragments were counted and weighed (to the nearest gramme). Quantification was carried out as follows: In the case of crustacean remains only chelae survived and a simple count of the total number of fragments and weight was made (only counting chelae tips which were >50% complete). Fish remains were quantified using the method outlined by Beech (1997). In summary, the following elements were recorded: vomer, articular, dentary, maxilla, premaxilla, quadrate, hyomandibular, opercular, abdominal vertebra, caudal vertebra, vertebra (indeterminate), cleithrum, posttemporal, and otolith. In addition, a number of special elements were recorded which were distinctive of particular genera or species, e.g. scutes for Carangidae, and pharyngeals for Scaridae. The remains of marine turtle (Chelonidae) were simply counted and weighed. This was because they mostly consisted of broken carapace fragments (with only the occasional rib or metapodial) and it was extremely difficult to define non-repeatable diagnostic parts of their skeleton. In the case of birds only the following skeletal parts were counted: proximal scapula,

proximal coracoid, distal humerus, proximal carpometacarpus, distal femur, distal tibiotarsus and distal tarsometatarsus. Terrestrial mammals were quantified using a modification of Davis (1992). The following parts of the skeleton were recorded: horncore (base with complete circumference intact), mandible (tooth row with at least 2 recordable teeth), isolated dP4s, P4s and molars, scapula (glenoid articulation), distal humerus, distal radius, carpal 2-3 (2 or 3 according to the taxon), distal metacarpus, ischial part of the acetabulum, distal femur, distal tibia, calcaneus, astragalus, distal metatarsus, proximal end of first phalanx, and third phalanx. At least 50% of a given part had to be present for it to be counted. Single metapodium condyles of caprines were counted as halves.

Counts were grouped into body zones in order to summarise the presentation of data. These were as follows: Custacea: ch = chelum; Fishes: sk = neuro-/branchiocranium region: vomer, articular, dentary, maxilla, premaxilla, quadrate, opercular, pharyngeal., av = abdominal vertebra, cv = caudal vertebra, v = vertebra, indeterminate, ap = appendicular skeleton: cleithrum, posttemporal, oth = otolith, scute; Reptile: ca = carapace, rib = rib, mp = metapodial; Bird: wi = wing: scapula, coracoid, humerus, carpometacarpus, hl = leg: femur, tibiotarsus, tarsometatarsus; Mammal: sk = skull region: horncore, mandible, mandibular dP4, P4, M1/2 and M3, fl = forelimb: scapula, humerus, radius, carpal 2-3, metacarpus, hl = hindlimb: pelvis (acetabulum), femur, tibia, calcaneus, astragalus, metatarsus, ph = phalanges: first phalanx, third phalanx. All non-diagnostic bone fragments were grouped into the following categories: indeterminate fish, indeterminate bird and indeterminate mammal, and were counted and weighed. Information concerning the modern size range, habitat preferences and present day methods utilised to catch Arabian Gulf fishes are taken from Carpenter et al. (1997) and Randall (1995).

Results

Tables 1-2 present the results of this analysis.

Jazirat Al-Hulaylah

A total of 2164 bone fragments (3.38 kg) were recorded from Jazirat al-Hulaylah, out of which 1102 (51%) were identifiable to the level of family, genus or species.

At least two types of crabs were represented amongst the Crustacean remains: Portunidae (swimming crabs) and Xanthidae (stone crabs), of which the former were more numerous. In the Arabian Gulf there are three species within the Portunid family according to Carpenter et al. (1997), of which Portunus pelagicus (Linnaeus, 1758) is the largest in size and also the only species exploited commercially in the region at the present day. The xanthid crabs are generally much smaller than the portunids and can be found between the lower intertidal up to depths of 35m on rocky outcrops or coral reefs. They are only occasionally taken for human consumption at the present day. The majority of the crab fragments from Jazirat al-Hulaylah were burnt, presumably indicating their consumption.

Thirteen genera of fishes were represented. Important families which were exploited included the Carangidae (jacks), Sparidae (sea breams) and Scombridae (mackerel/tuna etc.). There was a significant concentration of sea bream fragments, which mostly consisted of dentaries and premaxillae belonging to the genus Rhabdosargus. These all belonged to fishes about 20-30cm in total length. Marine turtle was also eaten judging from the substantial number of burnt carapace fragments. Several of the Phalacrocorax

nigrogularis (Socotra cormorant) bones were also burnt indicating that these birds may also have been occasionally consumed. Domestic mammals were represented predominantly by the remains of caprines. Out of those bones which it was possible to distinguish between sheep (Ovis ammon f. aries) and goat (Capra aegagrus f. hircus), they all belonged to the latter. A single fragment was identified as belonging to camel. Interestingly this distal scapula (glenoid) fragment was markedly burnt thus perhaps also suggesting that they were sometimes eaten.

Julfar

A total of 1354 bone fragments (1.33 kg) were recorded from the various contexts at Julfar, out of which 438 (32%) were identifiable to the level of family, genus or species. No crustacea remains were identified within any of the Julfar contexts. Thirteen genera of fishes were represented. Important families which were exploited included the Carangidae (jacks) and Scombridae (mackerel/tuna etc.). Ovens 131 and 134 contained concentrations of fish scales presumably resulting from some form of processing activities. In the case of oven 131, the scales may belong to Haemulidae: Pomadasys sp. as within the same context there was an operculum with identical scales still attached to its outer surface. Marine turtle only occurred as occasional carapace fragments in two out of the 19 sampled contexts. Both sheep and goat were represented amongst the caprine remains. A single fragment of a dog pelvis occurred in oven 134. This did not exhibit any signs of butchery or burning suggesting that it may have been eaten.

Discussion

The diverse range of fishes exploited at both sites suggests that subsistence strategies were geared towards exploiting a multi-species based fishery. Fish bones make up the bulk of the material at both Jazirat al-Hulaylah and Julfar perhaps suggesting their relative dietary importance. Caprines, mainly goats, would have provided regular contributions of meat as well as milk and other secondary products. Camels would have been used as a mode of transport and as beasts of burden for the shipping of materials, although it seems they may have been sometimes eaten during early Islamic Jazirat Al-Hulaylah. The vertebrate assemblages from Jazirat al-Hulaylah and Julfar broadly match those from the nearby site of Kush in terms of the importance of ovicaprid husbandry as well as fishing (Beech and Pipe 1997). Although the samples are small, the fact that a range of ovicaprid body parts are represented suggests that whole animals were brought to the site "on the hoof" for slaughter and consumption within the settlement area.

Table 3 summarises the modern size range, habitat preferences and present day methods utilised to catch the fish groups represented at the two sites. This suggests that fishing was predominantly carried out at both sites in adjacent coastal inshore waters near to coral reefs. Most of the fish represented were probably caught using a combination of inshore nets, traps and handlines. Some fishing however was also done probably further offshore in boats to target some of the pelagic species like tuna and kingfish (Thunnus sp. and Scomberomorus sp.).

Further more detailed work on the remainder of the vertebrate assemblages from Jazirat al-Hulayla and Julfar will undoubtedly highlight further details concerning the economic basis of the early and later Islamic periods of the region.

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	Elements represented	No. fragments	Weight (g)
Portunidae, indet.	10ch	10	8
Xanthidae, indet.	1ch	1	1
Carcharhinidae: Carcharhinus sp.	6v	6	1
Elasmobranch, indet.	10v	10	8
Myliobatidae: cf. Aetobatus narinari	14sk	14	5
Belonidae, indet.	1sk	1	1
Platycephalidae: Platycephalus indicus	2sk	2	1
Serranidae: Epinephelus sp.	8sk, 1av	9	9
Carangidae: Carangoides sp.	20sk	20	21
Carangidae: cf. Gnathanodon speciosus	1sk	1	3
Carangidae, indet.	14sk, 2ap, 1av, 30cv	47	31
Lutjanidae: Lutjanus sp.	1sk	1	1
Haemulidae, indet.	1sk	1	1
Lethrinidae: Lethrinus sp.	36sk, 6av,5cv	47	38
Sparidae: Acanthopagrus sp.	28sk, 2ap	30	33
Sparidae: Rhabdosargus sp.	107sk	107	77
Sparidae, indet.	31sk, 4av, 69cv	104	39
Scaridae: Scarus sp.	2sk	2	3
Sphyraenidae: Sphyraena sp.	4sk, 18cv	22	5
Scombridae: Thunnus sp.	9sk, 44av, 204cv	257	185
Scombridae, indet.	21sk, 9av, 211cv	241	447
Indeterminate fish		720	823
Chelonidae	129ca, 4rib, 1mp	134	690
Phalacrocorax nigrogularis	8wi, 11hl	19	27
Indeterminate Bird		72	55
Camelus ferus f. bactrianus	1fl	1	36
Capra aegagrus f. hircus	3hl, 1ph	4	15
Ovis ammon f. aries/Capra aegagrus f.hircus	2sk, 10fl, 4hl, 1ph	17	76
Indeterminate Mammal		260	740
TOTAL		**2160**	**3380**

TABLE 1.

Crustacea, Fish, Reptile, Bird and Mammal vertebrate remains represented in sample M3 (951125) from Level 1 (5^{th}-8^{th} century AD) at Jazirat al-Hulaylah, Ras al-Khaimah Emirate, U.A.E.

	House	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven	Oven
	H14 R9 R10	27	67	73	116	117	118	119	120	127	128	131	132	134	135	139	166	167	185
Carcharhinidae: Carcharhinus sp.														1v (1)					
Elasmobranch, indet.								1v (1)											
Clupeidae, indet.														3av,70cv (+)					
Serranidae: Epinephelus sp.											1sk,1v (1)								
Carangidae: Carangoides sp.									1sk (+)					3sk,7cv (8)					
Carangidae: Caranx sp.									1ap (+)										
Carangidae, indet.				7sk,1av (14)			1sk (+)	5sk,5av,4cv (4)	2sk,1av,4cv (3)				1sk (+)	9sk,11av,20cv,1sc (26)					
Gerreidae: Gerres sp.			1sk (+)									7sk (1)							
Haemulidae: Pomadasys sp.												13sk,1cv (1)							
Nemipteridae: Scolopsis sp.														1sk (+)					
Lethrinidae: Lethrinus sp.			2sk (2)				1av(1)							2sk (1)				2sk (2)	
Sparidae: Rhabdosargus sp.				1sk (1)									1sk (+)	2cv (+)					
Sparidae: Argyrops spinifer				2sk (8)															
Sparidae: cf. Argyrops spinifer				2cv(1)										1cv (+)					
Sparidae, indet.				1sk,1cv (5)								1sk (+)		1av (+)					
Sphyraenidae: Sphyraena sp.				2cv (6)				3sk,2cv (1)											
Scombridae: Scomberomorus sp.									1av,2cv (11)					8cv (17)					
Scombridae: Thunnus sp.				12av,16cv (27)										3sk,40av,8cv (35)					
Scombridae, indet.	3av (1)		1av (+)	7sk,10av,14cv (140)		1sk (2)	2av,6cv (10)	1av,3cv (1)	1sk,5av,4cv (7)				1cv (+)	10av,38cv (3)		2cv (+)		1av (+)	1cv (1)
Indeterminate fish		3 (1)	11 (2)	100 (56)		9 (1)		69 (8)	166 (20)	3 (1)	19 (3)	114 (4) *	10 (3)	201 (76) **	6 (2)	1 (+)		16 (3)	5 (2)
Chelonidae													1ca (2)	1ca (2)					
Ovis ammon f. aries				1sk,6fl,4hl (88)															
Capra aegagrus f. hircus				2sk,1fl,1hl,1ph (80)															
Ovis/Capra sp.				8sk,11fl,12hl,7ph (236)				1fl,3hl (11)	5sk,1fl,1hl,1ph (44)		1hl (9)			2fl,2hl (16)					
Canis lupus f. familiaris														1hl (19)					
Indet. Mammal			5 (5)	66 (194)	1 (+)			17 (11)	58 (39)				14 (5)	14 (30)			3 (2)	5 (5)	
TOTAL	3 (1)	3 (1)	20 (10)	296 (855)	1 (+)	10 (3)	10 (11)	114 (37)	254 (125)	3 (1)	22 (13)	136 (7)	28 (12)	460 (236)	6 (2)	3 (2)	3 (2)	24 (10)	6 (3)

TABLE 2.

Fish, Reptile and Mammal vertebrate remains represented in a selection of different contexts from Level 6 (mid-14th-16th century AD) at Julfar, Ras al-Khaimah Emirate, U.A.E.

Figures in table indicate counts. Figures in brackets indicate weight in grammes. + = less than 1g. * = also present c. 300+ fish scales perhaps belonging to Haemulidae: Pomadasys sp. ** = also present c.100+ small fish scales.

FAMILY	TAXON	JHU	JU	TYPICAL LENGTH (CM)	HABITAT	MODERN FISHERIES CAPTURE METHOD
Carcharhinidae	Carcharhinus sp.	*	*	100-340	Inshore - offshore	Gillnet, line gear, longline
Myliobatidae	cf. Aetobatus narinari	*		up to 230cm (width)	Open water	Drift net, Gillnet
Clupeidae			*	10-25	Coastal pelagic	Seine, gillnet, set net, lift net, shallow trawl
Belonidae		*		30-124	Pelagic offshore- pelagic coastal	Surface casting/trolling, seine, drift net,
Platycephalidae	Platycephalus indicus	*		60-100	Benthic on sand or mud bottoms, shallow to 25m	Bottom trawl
Serranidae	Epinephelus sp.	*	*	40-157	Seagrass beds, coarse sand, rocky banks, coral reefs, 6-200m	Hook-and-Line, trap, trawl
Carangidae	Carangoides sp.	*	*	50-100	Coastal inshore, rocky bottom, coral reef	Hook-and-Line, trap, gillnet, spear, trawl
Carangidae	Caranx sp.		*	60-165	Coastal waters, rocky reefs, coral reefs	Hook-and-Line, trap, gillnet, spear, purse seine
Carangidae	cf. Gnathanodon speciosus	*		Up to 110	Inshore rocky reefs, deep lagoons, seaward reefs	Gillnet, spear
Gerreidae	Gerres sp.		*	15-35	Clear, shallow waters, sandy bottom to 50m	Bottom trawl, beach seine
Lutjanidae	Lutjanus sp.	*		20-100	Estuarine, coral reefs, rocky reefs, at 3-100m	Handline, trap, bottom longline, trawl, gillnet
Haemulidae	Pomadasys sp.	?*	*	25-80	Coastal, sand and mud bottom, rocky or rock-sand bottom, to 60m	Trawl, trap, handline, gillnet
Nemipteridae	Scolopsis sp.		*	13-28	Shallow sandy or mud bottom, near coral reefs, to 60m	Trap, gillnet, trawl
Lethrinidae	Lethrinus sp.	*	*	20-80	Coastal over sand and hard bottoms, on/near reefs and seagrass beds, 1-80m	Trap, handline, trawl
Sparidae	Acanthopagrus sp.	*		30-75	Coastal areas, rough and muddy sand bottom, coral reefs, shallow to 50m	Bottom trawl, trap, handline
Sparidae	Rhabdosargus sp.	*	*	35-60	Coral reef, sandy or mud-sandy bottoms, shallow to 60m	Gillnet, seine, trap, handline, trawl
Sparidae	Argyrops spinifer		*	30-65	Variety of bottoms, 5-100m	Trawl, trap
Scaridae	Scarus sp.	*		32-57	Coral reefs, lagoons, shallow water over sand or sea grass bottoms, 1-60m	Trap, small-scale net gear
Sphyraenidae	Sphyraena sp.	*	*	20-180	Near surface, close inshore over shallow banks, near bottom, to 100m	Trolling line, nets
Scombridae	Scomberomorus sp.		*	55-220	Epipelagic coastal/neritic	Driftnet, trawl and trolling
Scombridae	Thunnus sp.	*	*	70-200	Epipelagic oceanic	Longline, purse seine

TABLE 3.

Fishes represented at Jazirat Al-Hulayla (JHU) and Julfar (JU) and their typical modern size ranges, preferred habitats and modern fisheries methods utilised to catch them - data taken from Carpenter et al. (1997) and Randall (1995).
* = present.